

REMARKS

Claims 1, 2, 12 and 13 are pending. Claim 1 is amended herein. Support for the amendments is detailed below.

Applicants' Response to the Claim Rejections under 35 U.S.C. §103(a)

Claims 1, 2 and 12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Spear (US 6,075,800) in view of Gen-Ei (US 6,618,420) and further in view of Nakamura (US 2003/0231685).

In response thereto, applicants respectfully submit that the combination of references does not render the invention as now claimed obvious, for at least the reason that the combination does not provide for all the features of the claims, nor is there any rationale prompting a skilled artisan to derive the present invention.

Specifically, the combination of Spear, Gen-Ei and Nakamura at least fails to provide for the features of parent claim 1 “an area of said first and second supports” and “an area of said semiconductor laser element,” wherein electrodes are formed on each of the ridges such that a ratio of an area of said first and second supports relative to an area of said semiconductor laser element” is more than 52.5%,

First, in regard to the current invention, as set forth in one possible embodiment per Fig. 4, “an area of said semiconductor laser element” corresponds to the area including electrodes on each ridges, and is proportional to chip width, Wc.

Second, in regard to the current rejection, in response to the addition of the element that “a ratio of an area of said first and second supports relative to an area of said semiconductor laser element is set within a range from more than 33% to less than 52%,” added to parent claim 1 in the last amendment, the current rejection cites to Nakamura as teaching this element at paragraph [0073] and Fig. 2 thereof. Further, the rejection maintains that it would be obvious to utilize the disclosed ratio in Nakamura within the combined Spear/Gen-Ei device on the basis that doing so would result in a laser capable of high speed capacity. In support of this reason to combine, the rejection cites to the general teachings of Nakamura’s Abstract. Further, the rejection maintains that Spear teaches the supports are used to provide a thermal conduction path as well as mechanical stability between the chips and substrate. Based thereon, the rejection concludes that a skilled artisan would have found it obvious to balance the size of the supports in order provide sufficient thermal conduction while maintaining sufficient high speed operations since a change in size is generally considered within the ordinary skill in the art.

In regard to the disclosures of Nakamura, W in Fig. 2 of Nakamura does not include electrode 25 and 26, as referenced by Fig. 1. Therefore, “a ratio of an area of said first and second supports relative to an area of said semiconductor laser element” cannot be calculated from Fig. 2 but Fig. 17 of Nakamura, since W of Nakamura is only a part of “an area of said semiconductor laser element” as now defined, and ridge width of Nakamura is only a part of “an area of said first and second support” as now defined.

As such, electrode 25 and 26 of Nakamura correspond to “supports.” Accordingly, “a ratio of an area of said first and second supports relative to an area of said semiconductor laser element” calculated by using Fig. 17a of Nakamura is 52.5% (electrode width of 25 and 26 and 26; 130+80=210, chip width; 400) and as calculated by using Fig. 17b of Nakamura (electrode width of 25 and 26; 160+160=320, chip width;500) is 64%. Furthermore it is inherent that “a ratio of an area of said first and second supports relative to an area of said semiconductor laser element” is more than 52.5%, since supports were formed on both sides of ridge 16 in Fig. 2 of Nakamura in addition to electrode 25 and 26.

As such, Nakamura does not provide for the feature of “a ratio of an area of said first and second supports relative to an area of said semiconductor laser element” is less than 52%. As the rejection acknowledges that a Spear/Gen-Ei device likewise does not provide for this feature, there is no disclosure thereof if the cited combination of references. Further, there is no viable rationale whereby a skilled artisan would modify a combination of Spear/Gen-Ei/Nakamura so as to derive the present invention.

First, as to the reason to combine based on the disclosures of Nakamura, applicants note that paragraph [0073] provides that the described example relates to shortening the width W of the active layer 6 so as to cause a reduction in the capacitance due to a pn junction thereof and a stray capacitance between the portions with the insulating film interposed there between can be reduced. As such, Nakamura is not teaching that the ratio of the example will cause a device to have high speed capacity. Rather, Nakamura is only stating that the shortening of the width of the active layer is desired. As neither Nakamura nor Spear disclose the ratio as a parameter there

is no rationale which could lead a skilled artisan to adopt this feature of the invention. Specifically, U.S. patent law provides that a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. See M.P.E.P. §2155.05.II.B. In the current instance, there is no recognition in the art of a ratio of an area of the first and second supports relative to an area of the semiconductor laser being a result-effective variable. There is no recognition within the prior art that the area should not be greater than 52 or 50% to retain the area to be used for the etching process observation as has been recognized by the current inventors.

Wherefore, applicants respectfully submit that the present invention as now claimed in not obvious in light of the combination of Spear, Gen-Ei and Nakamura.

Claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over Spear (US 6,075,800) in view of Gen-Ei (US 6,618,420) and Nakamura (US 2003/0231685) and further in view of Mitsuhashi (US 6,199,561).

By addressing the rejection of parent claim 1, as detailed above, likewise the rejection of claim 13 should be considered addressed by nature of its dependency.

Application No. 10/592,943
Art Unit: 2828

Amendment under 37 C.F.R. §1.111
Attorney Docket No. 062998

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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